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(56) Documents Cited  
GB 2225403 A GB 2176861 A GB 1226516 A  
US 4854185 A US 4690262 A US 4420988 A  
US 3859866 A

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UK CL (Edition L ) F2K  
INT CL<sup>5</sup> F16C 1/22

## (54) Adjustable cable installation in a motor vehicle

(57) An adjustable cable installation, for example for the throttle of a motor vehicle comprises a sheathed cable 24, 26 with an adjuster 32 at one end. The adjuster has a clip 38 which can be clipped onto one side of a vehicle fire wall and, an inner member 36 secured to one end of the cable sheath 24 can travel through the adjuster and through the fire wall to accommodate the range of adjustment required. A retaining yoke 46 retains the inner member against movement in one direction, a barbed formation 48 permitting movement in the other.

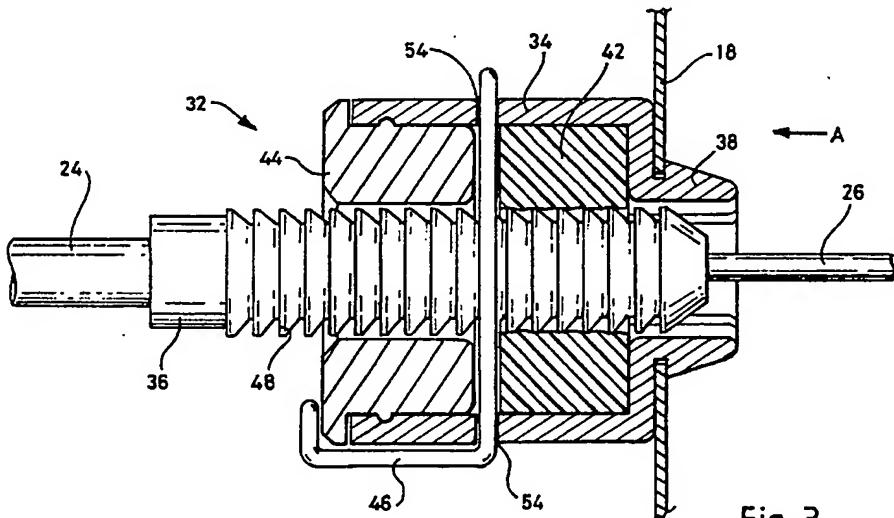
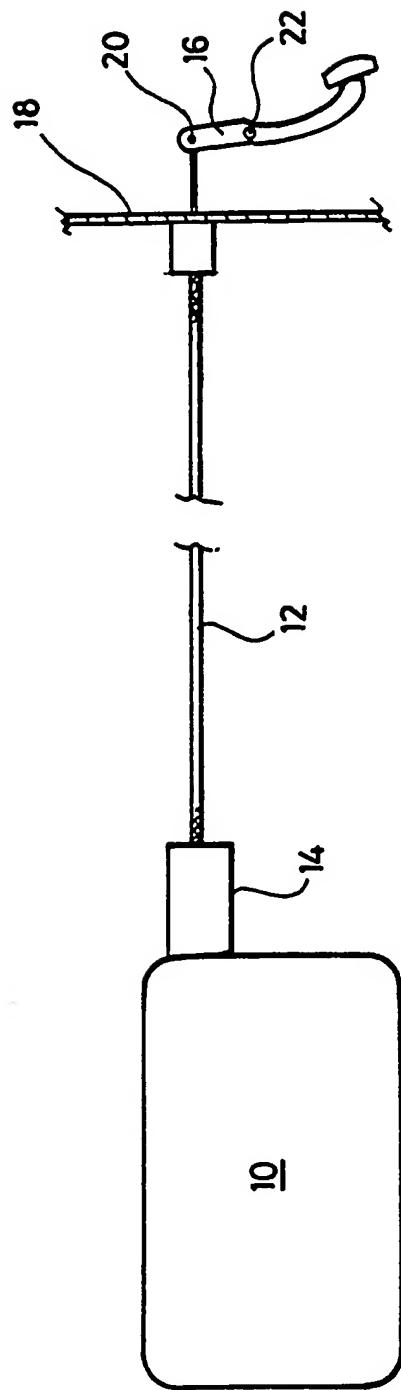


Fig. 3

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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.



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Fig. 1

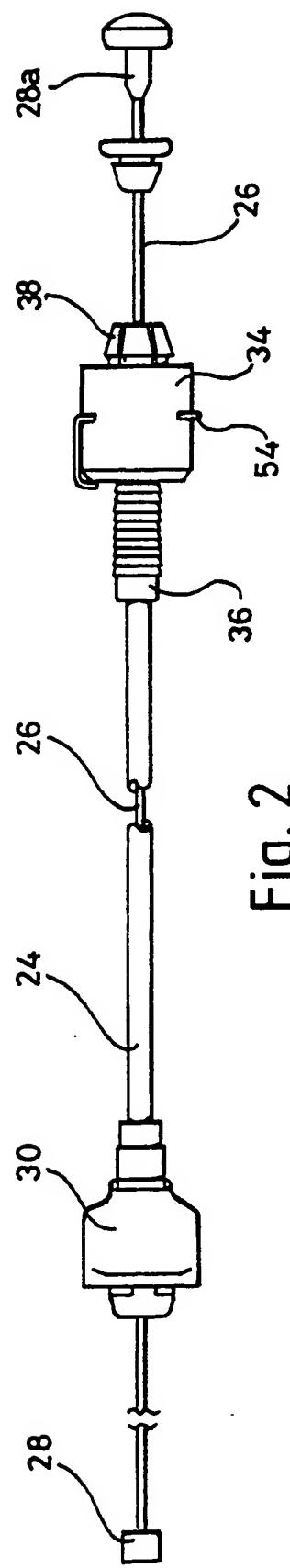


Fig. 2

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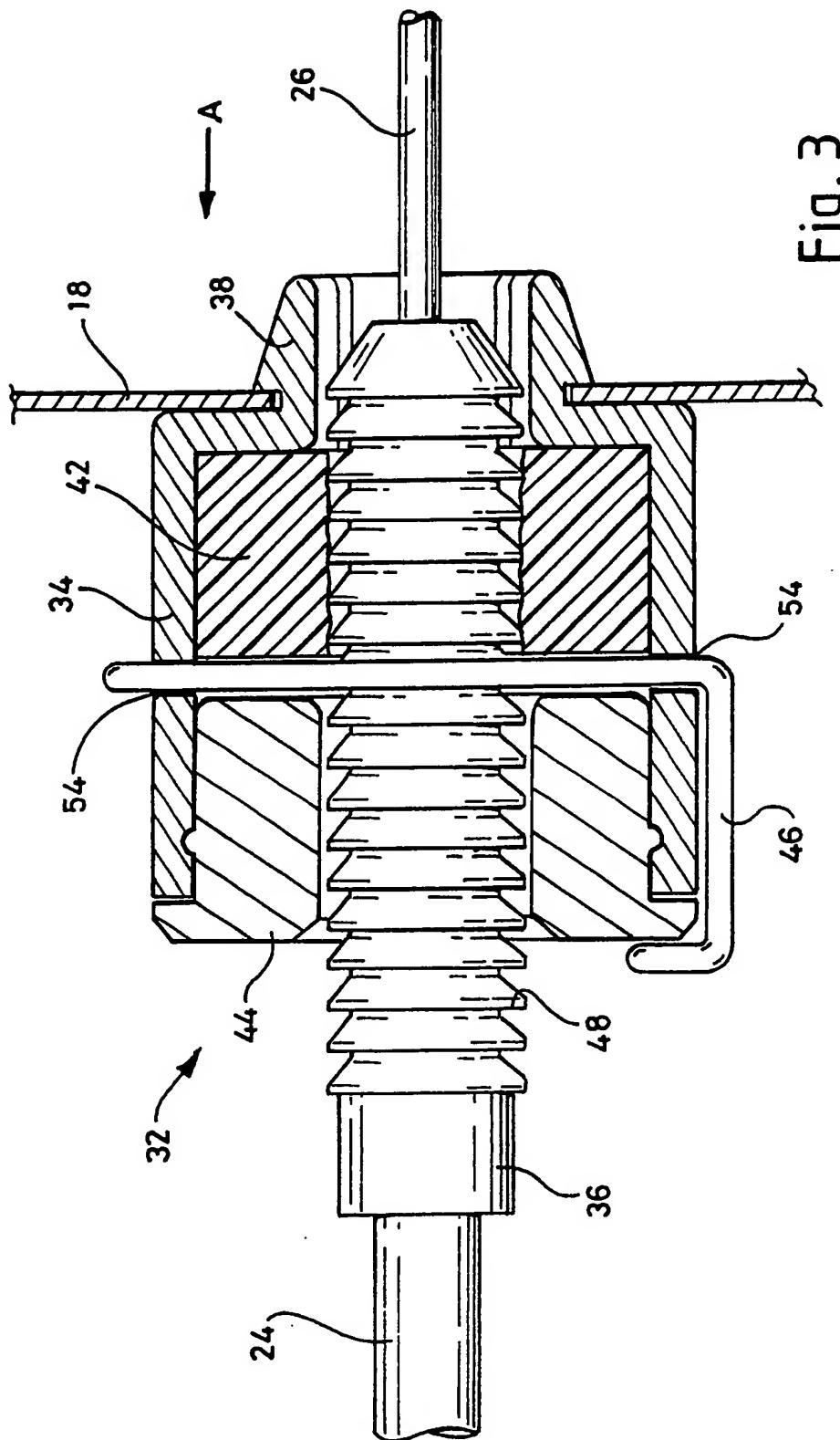


Fig. 3.

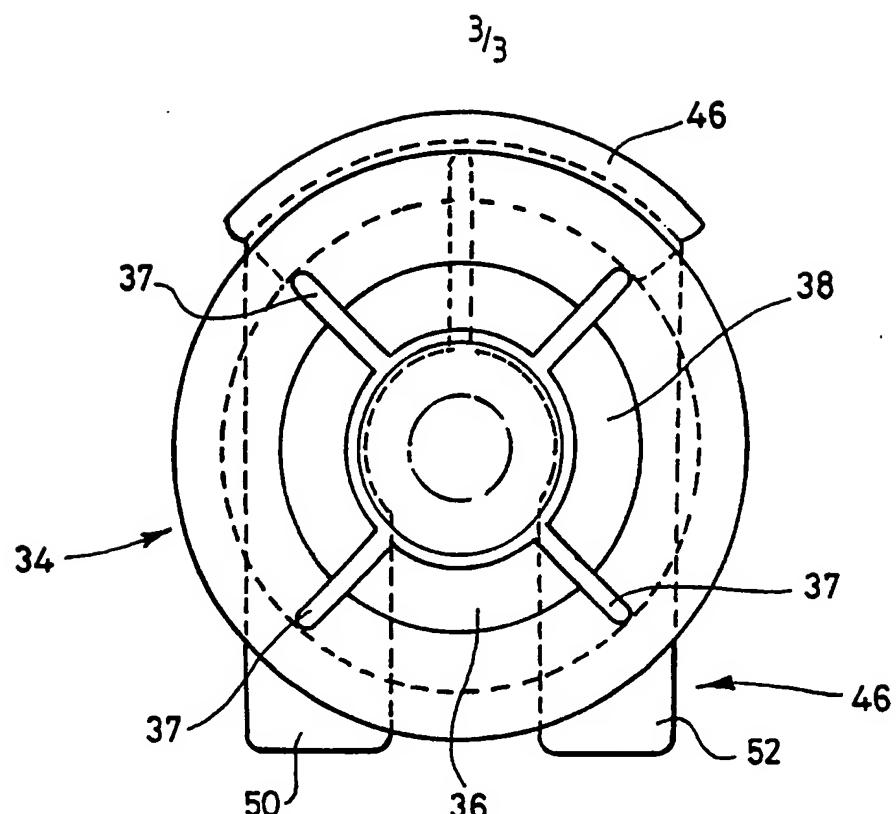


Fig. 4

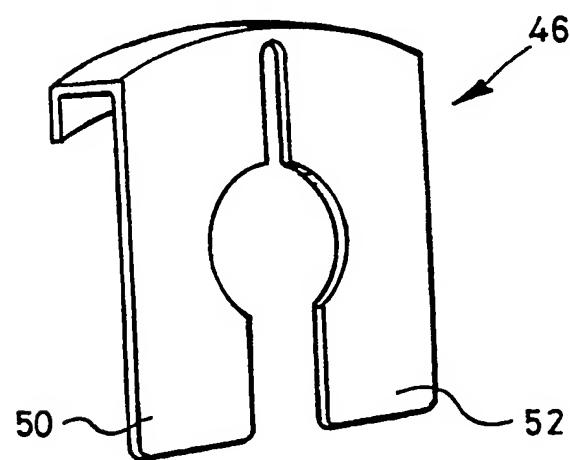


Fig. 5

Adjustable Cable Installation in a Motor Vehicle

This invention relates to an adjustable cable installation in a motor vehicle in which the effective length of the cable  
5 can be adjusted after installation of the cable. The installation is particularly applicable, for example, to the fitting of a throttle cable in a motor vehicle. The invention is not however limited to this application.

10 It is known to mount cable adjusters on a throttle cable. Known cable adjusters are conventionally positioned either at the engine end of the throttle cable, where they occupy valuable package space, or between the ends of the cable which requires that the cable be split into two with  
15 resulting cost penalties.

According to a first aspect of the present invention, there is provided an adjustable cable installation in a motor vehicle, the cable comprising an inner wire and an outer sheath, an abutment at each end of the sheath with at least one of the abutments incorporating a length adjuster, and the motor vehicle having a pedal connected to the inner wire of the cable and a fire wall through which the cable passes, wherein the adjuster is mounted on the fire wall and  
25 comprises an inner member fixed to the end of the sheath and an outer member mounted in a hole in the fire wall, with the inner member being able to move through the outer member and through the fire wall to its adjusted position.

30 Mounting of the adjuster on the fire wall, with the inner member being able to move through the fire wall, provides a particularly space saving package for the adjuster and makes use of the space which exists behind the pedal.

35 The adjuster outer member is preferably mounted on the fire

wall on the side of the fire wall opposite to the pedal.

The inner member may have a barbed outer circumference, and the outer member then has a resilient tooth arrangement

5 projecting into the bore in which the inner member moves, with the barbs on the inner member being arranged so that the inner member can move through the outer member in one direction but not in the other direction.

10 The resilient tooth arrangement of the outer member may be formed by a removable yoke which can be fitted into an aperture in the outer member, and can be withdrawn therefrom.

15 The outer member preferably has a spigot formed of resilient material at one end, with the spigot being adapted to be passed through and retained in a hole in the fire wall.

According to a second aspect of the invention, there is

20 provided a cable adjuster for use with a cable which has an inner wire and an outer sheath, the adjuster comprising an inner member to be fixed to the end of the sheath and an outer member adapted for abutment with an external structure, with the inner member having a barbed outer circumference,

25 and the outer member having a resilient tooth arrangement projecting into a bore in the outer member in which the inner member moves, with the barbs on the inner member being arranged so that the inner member can move past the resilient tooth member in one direction but not in the other direction.

30

The invention will now be further described, by way of example, with reference to the accompanying drawings, in which:

35

Figure 1 is a schematic arrangement of a cable installation in accordance with the invention;

5 Figure 2 illustrates a cable assembly for use in the installation;

10 Figure 3 is an enlarged view partly in cross section, of a cable adjuster forming part of the assembly shown in Figure 2;

Figure 4 is a view of the adjuster taken in the direction of the arrow A from Figure 3; and

15 Figure 5 is a perspective view of a retaining yoke.

Figure 1 shows a motor vehicle engine block 10 with a throttle cable 12 extending between a throttle unit 14 on the engine block and a throttle pedal 16. The throttle pedal 16 is located inside the passenger compartment of the vehicle, 20 and thus on the side of a fire wall or bulkhead 18 opposite to the engine 10. The cable 12 is connected to the upper end of the pedal 16 at 20 and the pedal is pivoted on an axis at 22, in a conventional manner. Depressing the pedal will pull on the cable 12 and when the driver's foot is removed from 25 the pedal, a return spring will return the pedal and the cable to its previous position.

30 The cable construction is shown in Figure 2. The cable has an outer sheath 24 and an inner wire 26. The wire 26 is longer than the sheath 24 and extends out of the sheath at each end. Each end of the wire 26 has a moulded-on ferrule 28, 28a. The shapes of these ferrules are different because 35 they are intended to engage with different components.

35 The sheath 24 has a first terminal fitting 30 which will

engage with a corresponding socket on the throttle unit 14. The connection between the terminal 30 and the body 14 will be such as to prevent relative movement between the sheath and the body 14, along the axis of the cable.

5

At the other end of the sheath 24 is an adjuster generally indicated at 32. The adjuster has an outer member 34 and an inner member 36, the inner member being mounted on the left hand end (as seen in Figure 2) of the sheath 24. The inner 10 wire 26 passes unobstructed through the inner and outer members 36, 34.

Figure 3 shows that the outer member 34 comprises a hollow body with a resilient spigot 38 at one end. This spigot, as 15 can be seen in Figure 4, is radially split so that it can be snap fitted into a hole in the fire wall 18. Within the outer body of the outer member, a grommet 42 and an end cap 44 are retained. The body also has holes in its wall through which a retaining yoke 46 can be inserted.

20

The inner member 36 has a barbed or fir-tree formation 48 along its length. When the retaining yoke 46 is put into place as shown in Figures 2 and 3, the inner member can move to the right and the angled flanks of the barbs 48 can push 25 through the two fingers 50, 52 of the yoke 46. However the inner member 36 will not be able to move in the opposite direction because the steep flanks of the barbs 48 will not be able to displace the fingers 50, 52 of the yoke.

30 As can be seen in Figures 2 and 3 in particular, the yoke 46 (shown alone in Figure 5) passes through guide slots 54 in the outer housing of the outer member 34.

In use, the cable assembled to the state shown in Figure 2 is 35 mounted in the vehicle and the ferrule 28 and terminal 30 are

connected to the throttle assembly 14. The ferrule 28a is connected to the pedal 16 and the spigot 38 is fitted into the fire wall 18. The cable length is then adjusted by pushing the inner adjuster member 36 through the outer member 5 34 until the correct position is reached. Whilst this is done, the retaining yoke 46 will be in place.

If the cable needs readjustment, for example during service or replacement, then the retaining yoke 46 can be withdrawn 10 to allow the inner member 36 to move to the left (as seen in the Figures) relative to the outer member 34.

When all the adjustment available with this assembly is taken up, the inner member 36 may project to a significant degree 15 through the fire wall 18 and into the space between the fire wall and the top of the pedal. However this space is normally otherwise unused and so good space utilisation is achieved.

Claims

1. An adjustable Bowden cable installation in a motor vehicle, the cable comprising an inner wire and an outer sheath, an abutment at each end of the sheath with at least one of the abutments incorporating a length adjuster, and the motor vehicle having a pedal connected to the inner wire of the cable and a fire wall through which the cable passes,  
5 wherein the adjuster is mounted on the fire wall and comprises an inner member fixed to the end of the sheath and an outer member mounted in a hole in the fire wall, with the inner member being able to move through the outer member and through the fire wall to its adjusted position.  
10
- 15 2. A cable installation as claimed in Claim 1, wherein the adjuster outer member is mounted on the fire wall on the opposite side to the pedal.
- 20 3. A cable installation as claimed in Claim 1 or Claim 2, wherein the inner member has a barbed outer circumference, and the outer member has a resilient tooth arrangement projecting into the bore in which the inner member moves, with the barbs on the inner member being arranged so that the  
25 inner member can move through the outer member in one direction but not in the other direction.
4. A cable installation as claimed in Claim 3, wherein the resilient tooth arrangement of the outer member is formed by  
30 a removable yoke which can be fitted into an aperture in the outer member, and can be withdrawn therefrom.
- 35 5. A cable installation as claimed in any preceding claim, wherein the outer member has a spigot formed of resilient material at one end, with the spigot being adapted to be

passed through and retained in a hole in the fire wall.

6. A cable adjuster for use with a cable which has an inner wire and an outer sheath, the adjuster comprising an inner 5 member to be fixed to the end of the sheath and an outer member adapted for abutment with an external structure, with the inner member having a barbed outer circumference, and the outer member having a resilient tooth arrangement projecting into a bore in the outer member in which the inner member 10 moves, with the barbs on the inner member being arranged so that the inner member can move past the resilient tooth member in one direction but not in the other direction.

7. A cable adjuster as claimed in Claim 6, wherein the 15 resilient tooth arrangement of the outer member is formed by a removable yoke which can be fitted into an aperture in the outer member, and can be withdrawn therefrom.

8. A cable adjuster as claimed in Claim 6 or Claim 7, 20 wherein the outer member has a spigot formed of resilient material at one end, with the spigot being adapted to be passed through and retained in a hole in an external structure.

25 9. An adjustable cable installation substantially as herein described with reference to the accompanying drawings.

10. A cable adjuster substantially as herein described with reference to the accompanying drawings.

## Relevant Technical fields

(i) UK CI (Edition L ) F2K

Search Examiner

T S SUTHERLAND

(ii) Int CI (Edition 5 ) F16C1/22

## Databases (see over)

(i) UK Patent Office

Date of Search

(ii)

15 MARCH 1993

## Documents considered relevant following a search in respect of claims 1-5

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X, Y	GB 2225403 A (MOPROD) - page 3 lines 6 to 8 and 19 to 22	X:1,2 Y:5
X, Y	GB 2176861 A (NIPPON CABLE) - figures 2,3 and 4	X:1,2 Y:5
Y	GB 1226516 (FORD) - figure 1	5
Y	US 4854185 (LICHTENBERG) - figure 3	5
X	US 4690262 (HOYLE) - column 5 lines 58, 59, column 6 lines 61 to 65, the figures	1-4
X	US 4420988 (DELIGNY) - figures 2 to 4	1,2
X	US 3859866 (DE GRAZIA) - the figures	1,2



Category	Identity of document and relevant passages - 9 -	Relevant to claim(s)

#### Categories of documents

**X:** Document indicating lack of novelty or of inventive step.

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**E:** Patent document published on or after, but with priority date earlier than, the filing date of the present application.

**&:** Member of the same patent family, corresponding document.

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